AMENDMENTS TO THE CLAIMS

Please amend the claims as shown in the following complete listing of all the claims.

1.(Currently Amended) An apparatus for excluding objects from introduction into a controlled area, comprising:

a portal structure adapted to scan a human subject;

~~a substantially co-planar~~ an array of ~~single axis~~ magnetic field gradiometers mounted on said portal structure, each said gradiometer including a pair of magnetometers adapted to sense an induced magnetic field of an object in at least one sensitive axis, each of said magnetometers being oriented to have ~~their~~ its said at least one sensitive ~~axes~~ axis parallel to said at least one sensitive axis of said other magnetometer of said pair ~~and in the plane of said gradiometer array~~;

at least one excitation ~~coil~~ source establishing ~~a~~ at least one magnetic excitation field adapted to induce said magnetic field of said object, said at least one excitation ~~coil~~ source being oriented to cause said at least one excitation field to have a substantially zero mutual inductance with said gradiometer array; and

a processor adapted to interpret signals from said gradiometer array to indicate the presence of said object.

2.(Currently Amended) The apparatus recited in claim 1, wherein said at least one excitation ~~coil~~ source is oriented to cause said at least one excitation field to have a substantially zero mutual inductance with said at least one sensitive axis of each of said magnetometers.

3.(Currently Amended) The apparatus recited in claim 2, wherein said at least one excitation ~~coil~~ source is oriented to cause said at least one excitation field to have its axis orthogonal to said at least one sensitive ~~axes~~ axis of said magnetometers.

4.(Currently Amended) The apparatus recited in claim 3, wherein said at least one excitation ~~coil~~ source comprises a single excitation coil, said single excitation coil being substantially co-planar with said gradiometer array.

5.(Currently Amended) The apparatus recited in claim 4, wherein:

said gradiometer array comprises first and second gradiometer sub-arrays, said sub-arrays being located on opposite sides of said portal structure;

said single excitation coil has first and second vertical legs;

said first vertical leg of said excitation coil bisects each said gradiometer of said first sub-array, substantially equidistant from each said magnetometer of each said gradiometer of said first sub-array; and

said second vertical leg of said excitation coil bisects each said gradiometer of said second sub-array, substantially equidistant from each said magnetometer of each said gradiometer of said second sub-array.

6.(Currently Amended) The apparatus recited in claim 3, wherein said at least one excitation ~~coil~~ source comprises two excitation coils, each said excitation coil being in a plane parallel to the plane of said gradiometer array, said excitation coils being on opposite sides of, and substantially equidistant from, said plane of said gradiometer array.

7.(Original) The apparatus recited in claim 6, wherein said two excitation coils comprise a Helmholtz coil arrangement.

8.(Currently Amended) The apparatus recited in claim 1, wherein said at least one excitation ~~coil~~ source is oriented to cause said at least one excitation field to have substantially zero mutual inductance with each of said gradiometers.

9.(Currently Amended) The apparatus recited in claim 8, wherein said at least one excitation ~~coil~~ source is oriented to cause said at least one excitation field to have its axis parallel to said at least one sensitive ~~axes~~ axis of said magnetometers.

10.(Currently Amended) The apparatus recited in claim 9, wherein said at least one excitation ~~coil~~ source is in a plane bisecting each said gradiometer, substantially equidistant from each said magnetometer of each said gradiometer.

11.(Currently Amended) The apparatus recited in claim 10, wherein:

said gradiometer array comprises first and second gradiometer sub-arrays, said sub-arrays being located on opposite sides of said portal structure;

said at least one excitation ~~coil~~ source comprises first and second excitation coils;

said first excitation coil being in a first plane bisecting each said gradiometer of said first sub-array, substantially equidistant from each said magnetometer of each said gradiometer of said first sub-array; and

said second excitation coil being in a second plane bisecting each said gradiometer of said second sub-array, substantially equidistant from each said magnetometer of each said gradiometer of said second sub-array.

12.(Currently Amended) A method for excluding objects from introduction into a controlled area, comprising:

providing ~~a co-planar~~ an array of ~~single axis~~ magnetic field gradiometers mounted on a portal structure, each said gradiometer including a pair of magnetometers, each said magnetometer being oriented to have ~~their~~ its at least one sensitive ~~axes~~ axis parallel to the at least one sensitive axis of said other magnetometer of said pair ~~and in the plane of said gradiometer array~~;

providing at least one excitation ~~coil~~ source;

~~energizing said at least one excitation coil to establish a~~ establishing at least one magnetic excitation field with said at least one excitation source, while orienting said excitation ~~coil~~ source to cause said at least one excitation field to have zero mutual inductance with said gradiometer array;

scanning a subject with said gradiometer array;

inducing a magnetic field in an object, with said at least one excitation field;

sensing said induced magnetic field of said object, with said gradiometer array; and

interpreting signals from said gradiometer array, with a processor, to indicate the presence of said object.

13.(Currently Amended) The method recited in claim 12, wherein said at least one excitation source comprises an excitation coil, and further comprising energizing said excitation coil with alternating current.

14.(Original) The method recited in claim 13, further comprising establishing said alternating current with a frequency of less than approximately 3000 Hz.

15.(Currently Amended) The method recited in claim 12, further comprising orienting said at least one excitation ~~coil~~ source to cause said at least one excitation field to have zero mutual inductance with said at least one sensitive axis of each of said magnetometers.

16.(Currently Amended) The method recited in claim 15, further comprising orienting said at least one excitation ~~coil~~ source to cause said at least one excitation field to have its axis orthogonal to said at least one sensitive ~~axes~~ axis of said magnetometers.

17.(Currently Amended) The method recited in claim 16, wherein said at least one excitation ~~coil~~ source comprises two excitation coils, further comprising:

locating said excitation coils in planes parallel to, on opposite sides of, and substantially equidistant from, the plane of said gradiometer array;

energizing said two excitation coils to establish a substantially non-diverging excitation field across said portal structure.

18.(Currently Amended) The method recited in claim 12, further comprising orienting said at least one excitation ~~coil~~ source to cause said at least one excitation field to have zero mutual inductance with each of said gradiometers.

19.(Currently Amended) The apparatus recited in claim 18, further comprising orienting said at least one excitation ~~coil~~ source to cause said at least one excitation field to have its axis parallel to said at least one sensitive ~~axes~~ axis of said magnetometers.